CLAIMS

1. A method for controlling a radio frequency (RF) transmitter, the method comprising:

using an integrating controller to produce a reference value of a first quality measure from a first error signal;

producing an estimated value of the first quality measure relating to an actual value of the first quality measure; and

supplying a tracking signal related to the estimated value of the first quality measure and the reference value of a first quality measure to the integrating controller.

2. A method as claimed in claim 1, wherein the first error signal is based on a reference value of a second quality measure and an estimated value of the second quality measure.

3. A method as claimed in claim 2, wherein the first error signal is the difference between the reference value of the second quality measure and the estimated value of the second quality measure.

4. A method as claimed in any one of claims 1 to 3, wherein the second quality measure is one of block error rate (BLER), bit error rate (BER), frame error rate (FER), a number of iterations performed by a decoder, or a value based on reliability of decision statistics.

5. A method as claimed in claim 1, wherein the tracking signal is the difference between the reference value of the first quality measure and the estimated

value of the first quality measure.

6. A method as claimed in any one of the preceding claims, wherein the first quality measure is a signal to interference ratio (SIR).

7. A method as claimed in claim 1, wherein the integrating controller is one of a proportional integrating (PI) controller or a proportional integrating derivative (PID) controller.

8. A method as claimed in claim 7, wherein the PI controller has the transfer function:

$$SIR_r = e^* K + \frac{1}{s}\left(\frac{e^* K}{T_i} + \frac{e_s}{T_t}\right)$$

in which SIR_r is the reference value of the first quality measure, e is the error in quality measure, K is a constant, e_s is the tracking signal and T_i and T_t are time constants relating to the integration and tracking unit respectively.

9. A method as claimed in claim 2, wherein the reference value of the second quality measure is set to produce a desired actual value of the second quality measure of the received signal.

10. A method as claimed in claim 1, wherein the reference value of the first quality measure is set to produce a desired actual value of the first quality measure of the received signal.

11. A method as claimed in claim 1, wherein the reference value of the first quality measure is set to

produce a command indicative of a desired change in transmission power.

12. A method as claimed in claim 1, wherein the tracking signal is filtered before being supplied to the integrating controller.

13. A method as claimed in claim 1, wherein an adjusted tracking signal is set to zero when the tracking signal is within a predefined value range, the adjusted tracking signal being supplied to the integrating controller in place of the tracking signal.

14. A method as claimed in claim 13, wherein the adjusted tracking signal is set to zero if the absolute value of the tracking signal is less than a predetermined threshold value.

15. A method as claimed in claim 1, wherein the integrating controller is operable to not update the integrator if the tracking signal indicates that an update would not be advisable.

16. A method as claimed in claim 15, wherein the integrating controller is operable to not update the integrator if the tracking signal indicates that the absolute value of the difference between the estimated value of the first quality measure and the reference value of the first quality measure is larger than a threshold.

17. A controller for controlling a radio frequency (RF) transmitter, the method comprising:

an integrating controller operable to produce a reference value of a first quality measure from a first

error signal;

an estimator operable to produce an estimated value of the first quality measure relating to an actual value of the first quality measure; and

a tracking unit operable to supply a tracking signal related to the estimated value of the first quality measure and the reference value of a first quality measure to the integrating controller.

18. A controller as claimed in claim 17, wherein the first error signal is based on a reference value of a second quality measure and an estimated value of the second quality measure.

19. A controller as claimed in claim 18, wherein the first error signal is the difference between the reference value of the second quality measure and the estimated value of the second quality measure.

20. A controller as claimed in any one of claims 17 to 19, wherein the second quality measure is one of block error rate (BLER), bit error rate (BER), frame error rate (FER), a number of iterations performed by a decoder, or a value based on reliability of decision statistics.

21. A controller as claimed in claim 17, wherein the tracking signal is the difference between the reference value of the first quality measure and the estimated value of the first quality measure.

22. A controller as claimed in any one of claims 17 to 21, wherein the first quality measure is a signal to interference ratio (SIR).

23. A controller as claimed in claim 17, wherein the integrating controller is one of a proportional integrating (PI) controller or a proportional integrating derivative (PID) controller.

24. A controller as claimed in claim 23, wherein the PI controller has the transfer function:

$$SIR_r = e * K + \frac{1}{s}\left(\frac{e * K}{T_i} + \frac{e_s}{T_t}\right)$$

in which SIR_r is the reference value of the first quality measure, e is the error in quality measure, K is a constant, e_s is the tracking signal and T_i and T_t are time constants relating to the integration and tracking unit respectively.

25. A controller as claimed in claim 18, wherein the reference value of the second quality measure is set to produce a desired actual value of the second quality measure of the received signal.

26. A controller as claimed in claim 17, wherein the reference value of the first quality measure is set to produce a desired actual value of the first quality measure of the received signal.

27. A controller as claimed in claim 17, wherein the reference value of the first quality measure is set to produce a command indicative of a desired change in transmission power.

28. A controller as claimed in claim 17, wherein the tracking unit is operable to filter the tracking signal.

29. A controller as claimed in claim 17, wherein the tracking unit is operable to produce an adjusted tracking signal which is set to zero when the tracking signal is within a predefined value range, the adjusted tracking signal being applied in place of the tracking signal.

30. A controller as claimed in claim 29, wherein the tracking unit is operable to set the adjusted tracking signal to zero if the absolute value of the tracking signal is less than a predetermined threshold value.

31. A controller as claimed in claim 17, wherein the integrating controller is operable to not update the integrator if the tracking signal indicates that an update would not be advisable.

32. A controller as claimed in claim 31, wherein the integrating controller is operable to not update the integrator of the tracking signal indicates that the absolute value of the difference between the estimated value of the first quality measure and the reference value of the first quality measure is larger than a threshold.

33. A computer program product comprising code elements which, when run on a computer, cause the computer to operate in accordance with any one of claims 1 to 16.